



Blood pressure response to patterns of weather fluctuations and effect on mortality

Author(s): Aubiniere-Robb L, Jeemon P, Hastie CE, Patel RK, McCallum L, Morrison D, Walters M, Dawson J, Sloan W, Muir S, Dominiczak AF, McInnes GT, Padmanabhan S
Year: 2013
Journal: Hypertension. 62 (1): 190-196

Abstract:

Very few studies have looked at longitudinal intraindividual blood pressure responses to weather conditions. There are no data to suggest that specific response to changes in weather will have an impact on survival. We analyzed >169 000 clinic visits of 16 010 Glasgow Blood Pressure Clinic patients with hypertension. Each clinic visit was mapped to the mean West of Scotland monthly weather (temperature, sunshine, rainfall) data. Percentage change in blood pressure was calculated between pairs of consecutive clinic visits, where the weather alternated between 2 extreme quartiles (Q(1)-Q(4) or Q(4)-Q(1)) or remained in the same quartile (Q(n)-Q(n)) of each weather parameter. Subjects were also categorized into 2 groups depending on whether their blood pressure response in Q(1)-Q(4) or Q(4)-Q(1) were concordant or discordant to Q(n)-Q(n). Generalized estimating equations and Cox proportional hazards model were used to model the effect on longitudinal blood pressure and mortality, respectively. Q(n)-Q(n) showed a mean 2% drop in blood pressure consistently, whereas Q(4)-Q(1) showed a mean 2.1% and 1.6% rise in systolic and diastolic blood pressure, respectively. However, Q(1)-Q(4) did not show significant changes in blood pressure. Temperature-sensitive subjects had significantly higher mortality (1.35 [95% confidence interval, 1.06-1.71]; PEuro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)0.01) and higher follow-up systolic blood pressure (1.85 [95% confidence interval, 0.24-3.46]; PEuro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)0.02) compared with temperature-nonsensitive subjects. Blood pressure response to temperature may be one of the underlying mechanisms that determine long-term blood pressure variability. Knowing a patient's blood pressure response to weather can help reduce unnecessary antihypertensive treatment modification, which may in turn increase blood pressure variability and, thus, risk.

Source: <http://dx.doi.org/10.1161/hypertensionaha.111.00686>

Resource Description

Exposure : ☒

weather or climate related pathway by which climate change affects health

Precipitation, Solar Radiation, Temperature

Geographic Feature: ☒

resource focuses on specific type of geography

Climate Change and Human Health Literature Portal

None or Unspecified

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Scotland

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Cardiovascular Effect

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): high blood pressure

Medical Community Engagement: ☒

resource focus on how the medical community discusses or acts to address health impacts of climate change

A focus of content

Population of Concern: A focus of content

Other Vulnerable Population: those with BP sensitive to modulations in temperature

Resource Type: ☒

format or standard characteristic of resource

Research Article

Resilience: ☒

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale: ☒

time period studied

Time Scale Unspecified